SFB 631

Festkörperbasierte Quanteninformationsverarbeitung

Seminar Announcement

Physics Colloquium

Location University of Regensburg, Dept. of Physics
Room H 34

Time Monday, 8th December 2008
4:15 p.m.

Speaker **Prof. Dr. Giorgio Parisi**

Universita di Roma (Sapienza)
Dipartimento di Fisica

Title An empirical study of large starling flocks

Abstract:
Numerical models indicate that collective animal behaviour may emerge from simple local rules of interaction among the individuals. However, very little is known about the nature of such interaction, so that models and theories mostly reply on aprioristic assumptions.
I will report on recent experiments that have reconstructed the three-dimensional position of individual birds in airborne flocks of a few thousand members.
The analysis of the data shows that the interaction does not depend on the metric distance, as most current models and theories assume, but rather on the topological distance. I argue that a topological interaction is indispensable to maintain the flock's cohesion against the large density changes caused by external perturbations, typically predation.
This hypothesis is supported by numerical simulations, showing that a topological interaction grants significantly higher cohesion of the aggregation compared to a standard metric one.

Contact: Prof. Milena Grifoni, Phone 2035